

AVIATION WEEK

APR. 5, 1948

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The "Sleeperette"—Pan American's exclusive, new aircraft seat, completely cushioned with **Airfoam** made by Goodyear—sets a new high for travel comfort aboard Pacific-Alaskan Division Clippers. Yes, there are three good reasons why operators and manufacturers prefer **Airfoam** for aircraft seats. First, this latex cushioning supplies comfort that lessens

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The *Passenger* is the payoff

- Commercial airline operation pays off for the airline and for the aviation equipment manufacturer only if a plane and its outfit satisfies the customer—the passenger.
- The objective of Sperry, for instance, is to build equipment that helps the airline give the passenger a smoother, safer, more comfortable ride. It is the aim toward which much of the engineering, skill, research and development work at Sperry is aimed.
- Behind the instrument panel and in the cockpit of every modern airliner stands research and engineering skill. Sperry provides for airline use, for

example, the Air-Et Gyroplane® for altitude level flight... the Automatic Approach Control for landings in all kinds of weather... the Gyrocomp® Compass and other flight instruments for accurate information on position and direction... the Engine Analyzer to check engine performance during flight, saving valuable time on the ground.



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- These and other products of Sperry are designed to help the passenger enjoy his journey from take-off to landing—to complete a trip independent of either, relaxed, refreshed and at ease.
- Meanwhile, Sperry research and engineering development go on in a continuous search for new and better aids for aviation.

Forrestal's 3-Way Dollar

Republican Senators are not impressed with Defense Secretary Forrestal's philosophy, that if a dollar is spent for the Air Force the Navy and Army must each get a dollar too. Forrestal has presented such one range argument against building the Air Force up to the 70 Group strength that Eisenhower, Spaatz and both the airmen and Congressmen Air Force groups recommended as a long-term measure. He contends stubbornly that equal expenditures would be required for Army and Navy.

The Republican Senators point out that the Army needs departmental policies, and endorse they will continue to push for Air Force expansion in top priority since the Navy is already larger than the combined forces of the rest of the world and thus, outside question whether the Army will ever be able to compete with the tremendous mass of the Russians who already has 180 divisions in the field.

Regulations Hit Feeders

President Eisenhower's policy of civil liberties has been attacked by CAA critics providing for modification of flight equipment. Cost of installing terrain clearance indication and flight recorder, and of changes in the content of the provision, has been a serious factor on the local carrier's resistance.

See-Air Lull

There is no lull for us as yet, legal from the airport. The See-Air Committee of the National Federation of American Sighting, has closed up for the season, and they feel, the committee's inactivity, chairman, "is referred to Chairman. But despite committee will move their drive for an eight next year. Privately, they hope that in the meantime overseas airlines will lose ground to American, and that they will be a changed political complexion in Washington more receptive to the transportation position.

Meanwhile, Sperry research and engineering development go on in a continuous search for new and better aids for aviation.

Democrats Back Retraint

Growing support for D. W. Reaist in Administration of Civil Aeronautics is reported, not only from the airlines but including endorsement of the Democratic National Committee. Its endorsement is made from outside CAA.

NEWS SIDELIGHTS

Treasury Back-Tracks

Strong Republican attacks on the former role allotted expenses in his testimony National Defense program have forced Treasury to President Truman's supplemental budget message to Congress.

Originally only a \$775,000,000 increase in aircraft procurement funds was authorized, of which only \$450,000,000 would go to the Air Force.

Now Truman is planning to boost the Air Force view of the supplemental to bring it close to the \$1,200,000,000 annual procurement level required for the 70 Group program.

Democratic high command admits it got bad advice from the Marshall Staff. Chiefly that that dashed references to support from Truman's special message to Congress two weeks ago.

New Democrats fear they have incurred Republican wrath with a highly popular wide-scale campaign. Recent Gallup Poll showed 75 percent of the people favored support in the Senate in the National Defense legislation.

Revised now appears to have the most favored position.

Paul H. Lee, acting administrator, and Joe Mancini, West Coast regional CAA administrator, are still under no illusions, but have no present political backing. Their view, who is president of the airline-owned American Airlines Inc.

Dead Body Will Report

See Owen Bennett who served as chairman of the officially distinct Senate War Investigating Committee states that the group will make two reports shortly.

One is on subordination is based on a summary examination of the subject by the committee and is expected to emphasize the failure of the Administration on the home front during the last war.

The other report, on procurement, will highlight shortcomings of Air Force position, particularly in disclosure during the investigations of Maj. Gen. Joseph M. Bowers.

The procurement report will, most

advocate in the Higher Aircraft development. A Republican and Democrats fail to agree on treatment of the new Democrats the free market along of changes that Elliott Roosevelt control influence in the event of the Higher controls. Republicans, in their view, are wary of digging out the old "The American-International" charges against America.

Reed Set as Chairman

If Republicans return their majority in the Senate next year, GOP Sen. Reed of Kansas is slated to become chairman of Senate Joint Committee on Aeronautics which handles all civil aviation legislation.

Present chairman of the Committee, GOP Sen. White of Maine, has announced he will not seek reelection. Next ranking Republican, Sen. Wiley of New Hampshire, will be past chairman of the Senate Committee on Aeronautics and Commerce.

Reed has sponsored numerous measures advocated by railroads in Congress. Democratic Sen. Johnson of Colorado, ranking minority member of Interstate Commerce, has announced he will resign and is presently considered a sure winner.

Something for Everybody

The highly publicized Key West "agreement" of the Joint Chiefs of Staff, heralded as putting an end to inter-service rivalry and defining an overall strategic plan for U. S. defense, appears on closer scrutiny to have settled most of the basic inter-service problems. Washington observers say it provides only a new set of rules for five military chiefs working closely.

They are not completely excluded from coordinating strategic bombing operations nor is the Air Force excluded from joint submarine operations, now being prohibition of shipping at sea, and so on.

Despite opposition of MATS to provide as lift for all Armed Services, the Key West document reaffirms the Navy to provide "air transport control for naval operations." Both Air Force and Navy are authorized to conduct aerial warning operations.

Full reference in the inter-service agreements that show no sign of abating, will be the Joint Chiefs of Staff with the Defense Secretary stating the developing role in cost of defense.



HOW TO INSTALL AN OIL SEAL IN 10 SECONDS FLAT

■ It can be done—even on an impossible shaft like the one pictured here—with a Johns-Manville split-type Clipper Seal. Just three simple steps complete the job:

(1) Hook the detachable garter spring around the shaft (2) Spread the seal apart as the shaft is shown above, and slide it over the shaft (3) Slip the garter spring inside its groove in the seal and press the assembly into the cavity.

That's all. Installation is actually a matter of seconds. Completely new in principle, Clipper Seals have no axial cut. Their rigid lead and soft flexible lip are molded into a single unit to provide a seal of superior lubrication-retaining, dirt-excluding qualities. The spring adjusts lip pressure, contributes to more effective sealing and longer life.

Clipper Seals are made in both split and endless types and are available for shafts up to 50" in diameter. They are recommended for sealing against oil, grease, water, air, gas and chemicals at operating temperatures up to 450°F.

For further information, write for brochure PM-31A. Address: Johns-Manville, Box 200, New York 16, New York.



8 REASONS WHY CLIPPER SEALS LAST LONGER—SEAL BETTER

1. Various elements for design are available to fit a variety of designs to meet more difficult working conditions.
2. Garter lead is rigid lead on shaft to draw it to the cavity against a tapered part of the point.
3. Garter lead is mechanically welded body to lip to seal with no weak bond of connection.
4. Garter Spring Seal has the same sealant mechanically bonded to the lip and garter spring attached continuously.
5. Action of garter spring adjusts lip pressure to provide more effective sealing and longer life.
6. Single continuous construction, detachable seal mounted without change in lead that seal can be installed.



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Vol. 48, No. 14

**AVIATION
WEEK**

April 5, 1948



Secretary Forrestal (right) confer with defense aides before Senate testimony. Left to right, Kenneth Rusk, Secretary of Army; John L. Sullivan, Secretary of Navy; and W. Stuart Symington, Secretary of Air Force. (From Army photo)

Fight For 70 Group Air Force Flares Again on Capitol Hill

Republican Senators attack Truman Administration throttle on airpower; \$775,000,000 boost urged in plane procurement appropriations.

Light for the 70 Group Air Force flared again on Capitol Hill last week as Republican Senators attacked Defense Secretary Forrestal's new national defense program that throttled the Air Force back to its present 55 group status. Forrestal recommended a 10 percent increase of \$775,000,000 in aircraft procurement and procurement funds. This group would be divided into 175,000, 000 for research and development, 542,000,000 for Air Force plane procurement and 2,250,000,000 for more Navy plane procurement.

Sharp questioning by Republican members of the Senate Armed Services Committee enabled Air Force Secretary W. Stuart Symington and Chief of Staff Gen. Carl A. Spaatz to evade Forrestal's undisciplined pay rule and express their disagreement with the Defense Secretary's role assigned to support.

► **Truman Policy**—Forrestal's plan which

recommitted no packaging all resources deemed necessary for current needs in the fiscal 1949 budget.

► **Spouts** First-Republican Senator Henry Cabot Lodge (Mass.), William Knowland (Calif.) and Laurent Schmitt (Mass.) and Democrat Lytle Hill, of Alabama, indicated by their line of questioning that they were not satisfied with the role Forrestal and the Truman Administration have allotted to the engineer in their push to get a universal military training and peacetime draft approval.

Under questioning both Spouts and Symington were emphatic in their stand that the 70 Group program represents maximum impact needs and that the 55 Group program urged by Forrestal is not adequate. They stated flatly that the Air Force and the aircraft industry stood ready to begin implementation of the 70 Group program immediately if the necessary funds were approved.

► **54 Modern Groups**—Forrestal's Air Force budget calls for maintaining strength at 55 groups with replacement of outmoded new planes to run 34 groups with modern types. Symington pointed out that the Air Force can obtain all personnel required by voluntary enlistment and its only real concern in national military training is in seeing that the Army Ground Force have sufficient personnel to discharge their homekeeping commitment to the Air Force. Symington sharply questioned that the Air Force was capable of winning limited combat air effects on any sort of basis from here on out by USAF planes. He revealed that these attacks were based on an analysis of military training which the Air Force pointed in recent policy operations.

Rebels' Common Aesthetics conducted extensive peacetime experiments with an airplane of the Boeing and Navy and land but Symington's revelation was the first indication of USAF tactical application of an effective technique. He said USAF B-29s at the Strategic Air Force would be equipped with the refueling equipment by the end of the year.

► **B-29 Capabilities**—Symington and the tactical roles of the B-29 on non-2000 nuclear units, a considerable increase over its wartime capabilities. Credit for this increase belongs to Gen. George Kenney's Strategic Air Command which has pioneered in more efficient B-29 operation through crew control and other techniques. Symington's statement that the B-29 beats all new

placements opportunities and would

BRIEFING PRODUCTION NEWS

Municipal-Henry & Regulator Co. is fabricating new electronic automatic control equipment for the Boeing B 70 and Convair B 36 bombers. The Aeronautical Division is working on development and production contracts for several million dollars worth of special equipment, including electronic fuel gauging instruments standard on five fighters and commercial airplanes. Research and development work is ongoing on special jet aircraft control equipment.

Republic Austria Corp. has sold Associated Motors, Inc., Syracuse, N. Y., to Tveder Corp. of Chicago for \$1,600,000. This will give Tveder a certain supply of water-cooled engines for the Tveder-Torpedo automobiles. Automobile engine production is scheduled to reach 300 a day. Associated will continue manufacture and development of Franklin aircraft engines of under 450 hp.

Glass L. Martin Co. chemically dissolves, Patuxent, Ohio, has made its first shipments of Marvynl VR 11, a thermoplastic vinyl resin marketed as a fine, white powder. Annual production at the new \$4,200,000 factory is scheduled to reach 25,000,000 lb.

Lockheed Aircraft Service, Inc. has added three new international customers at its MacArthur Airport base on Long Island. Pan American Airways, Airvion Guest and Pont de Briel have contracted for modification and maintenance services, including a complete integral fuel tank stripping and cradling job on the PAA DC-4.

G. M. Gossens and Co. reports a 1947 production of over 1000 picture-transducer units for picture search and control systems. These units convert picture info into electrical signal at the order; data signal being carried into the antenna transmitting and for telemetering to the ground. In addition to this system power plant work, Gossens built over \$1,000,000 worth of radio apparatus during last year and expects to double this output during 1948.

SKF Industries, Inc., ball and roller bearing manufacturer, has established its first headquarters at Charlotte, N. C., to increase service to North and South Carolina. 30 branches in eastern Tennessee and two branches in northern Georgia.

Helicopter Standard division of United Aircraft Corp. announces that eight aircraft operating in six countries have selected three-blade Hydromatic propellers for installation in their Conquest-Liners. These include Western Air Lines, Rio Airways, Com World Airways, Continental and Northeast Airlines. Foreign airlines include FAMA, of Argentina, KLM of Holland, Orient Air of India, SAFENA of Belgium, Trans Australian Airways and Aeroline of Brazil. The blades are 15 ft in diameter, hollow steel, swept forward, electric de-ice, steel fuselage and cowling.

Avco Engineering Corp. is holding a guided missile course for a select group of officers of Army Ground Forces, Navy, Canada and England. The course includes 19 lectures and numerous field trips to rocket and missile exhibitions in the Southern California area.

Buffalo Stainless Cont'g. Co., has purchased a \$100,000 plant in Buffalo from the Otis Elevator Co., where it will produce stainless steel castings for the machine and other industries. Employment between 300 and 350 is anticipated.

General Electric Co. introduces a new savings and stock bonus plan for its 700,000 employees. The company will contribute up to 15 percent of the employee savings in the form of G-E stock, provided the savings are retained for a period of five years.

Republic Airlines has completed the first step of P44 Turbojet module testing tests for delivery to the Air Force. The set consists of 14 pieces weighing about 12,000 lb, 13 of which were designed and built by Republic. The other is a C-17, of which only the engine is built by Republic. The engine tests include subjects of loading test, electrical system, idle system, vibration simulation, hydraulic system, instrument calibration, air conditioning system, pilot's seat operation equipment, canopy operation and pressurizing system, fuel system and oxygen circulation.

Boeing Aerospace Co. is producing 8 H 30 bombers at a rate of seven per month, with 15 already delivered. Last five C-97s are on the line and the first production Stratolifter is expected to fly early this month. Second XB-70 is in final stages of assembly. Development is \$4.6B., on about 10,000 man/hrs. 1

201,493 (59 percent government)
UNIC's profit was 50,516,291

On work of other divisions, UAC re-

* Chance Vought completed its F-4U-Navy fighter contract in 1947 and started deliveries on an order for 325 F4U-1s. F4U-5 production is expected to continue throughout most of this year and will be supplemented by the output of CV's first jet plane, the F60 Eagle.

CV has submitted to the Navy its proposal for a five year lease of the former North American Aviation plant at Grand Prairie, Tex. (Aeronautics News, Dec. 20, 1947). Provisions for lease extensions and "for a right of first refusal to purchase the plant" are included. It will request a year or more to transfer CV's operations from St Louis.

* Sukorin Dzerzh, in addition to its deposits of military, Naval and commercial versions of the four-plane 851, has delivered the first of three NRP-15, five plane Naval contract.

• United Aircraft Export Corp. shipments in 1947 were more than double the export sales of 1938, which the company counts as the last prewar year.

Continental's Aircraft

Leveling off of the personal plane industry slashed Continental Motors Corp.'s aircraft engine revenue nearly in half in the fiscal year ending Oct. 31, 1947. Sales dropped in the aviation division from \$14,740,000 in 1946 to \$8,003,000 in 1947.

The company, however, successfully landed a production order for inter-satellite jet engines for the government and expanded its research and development work for military and commercial purposes during the war.

Continental Motors' total sales in 1947 were \$69,947,661 or 7.7 times greater than its average sales in 1938 and 1940. Aggregate sales of eight competing engine manufacturers increased only 3.9 times in the same period.

Net loss for this year, after a tax credit of \$7,680,000, was \$2,049,216, compared with a net loss of \$3,645,739 in 1946 after tax credit of \$11,793,800.

Sales for the first quarter of the current fiscal year totaled \$20,747,295 compared to \$14,883,762 a year ago. Net profit, after provision for a \$175,000 reserve for federal income taxes, was \$195,510. That compared with a net loss of \$1,378,940 in the corresponding period a year ago after a tax refund credit of \$1,345,000.

During the past fiscal year, the company paid its president, Clarence Reese, \$52,826 and its executive vice president, Lewis F. Kall, \$29,299. That is \$5,488 less for Reese and \$7,449 less for Kall than they received in the previous year.



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How Friction looks to Dr. Seuss

Widely known as an author and illustrator, Seuss is shown in a caricature above. The cartoon depicts Seuss as a man with a large nose and a small body, wearing a suit and tie. He is holding a pen and looking at a large, stylized drawing of a bird-like creature standing on a large, stylized wheel or gear. The creature has a long, pointed beak and is looking down at the wheel. The wheel has a large, stylized 'S' on it. The background is a simple, stylized landscape with a few trees and a small building.

The Friction Finch, of course you know,
Is wacky wack. He loves to go
To places where machinery whirrs
And greases men as fast as ever.
By leaving down on shafts and wheels
With his grease gun and his tools,
Which rub, and rub, and rub, and rub
And rub away your profits, too.



To Dr. Seuss friction is a nightmare.
It's a nightmare to the manufacturer,
too! For friction is the great enemy
of production. It wears down
parts. Kicks up costs.

Ball bearings help end this. They

ensure greater torque, more precise
alignment of parts. By permitting
higher speeds, they increase produc-
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AVIATION WEEK, April 5, 1968



Canadian-built SG Mark VI-D in hoist pickup trial. Tail rotor boom aft of cabin to aft of engine is normally covered by removable panels.

Canada's Bid in Helicopter Field

First production model of SG Mark VI-D rotorcraft now flying,
with further output scheduled to begin upon certification.

By IRVING STONE

A production model helicopter, the three-rotor, five-bladed SG Mark VI-D, is Canada's latest bid in the field of rotary wing competition. Sponsor of the project, which recently made its first flight, is a group of industrialists known as the Helicopter Industry Association of Montreal.

Because limited development funds were available, the best features of conventional helicopter practice were used and elaborated upon to produce a very rigid, sound and compactly designed air machine.

Designed by U.S. engineers—Burnard W. Sawyer and Selma G. Gauthier—the general configuration of the craft is distinct from that of any other industrial helicopter.

► Production Phase—Production is scheduled to begin immediately after certification by the Canadian Government. And since design has been an outgrowth of CAR 66, wind-tunnel certification in this country will be sought at time of applying to Canada.

The VI-Ds had are reported to have shown that the craft is considerably free from vibrations, stall shocks, and annoying lag of control systems.

This is attributed to the high speed (230 mph) low-stall, four-bladed

rotor control linkage, permitting the blades to lag or lead without affecting the pitch setting system, regulation of blade extension limits and also increase in torque arranged so as to prevent load shedding, while the blade changes position in plane of rotation and outer hinge control member interacting the swashplate with the rotor zero air loading, partly irreversible area, thereby to prevent possible rotor lock-up during the stall.

► Performance—Powered by a 165-hp Franklin engine, horizontally mounted, the VI-D rotorcraft would be capable of carrying two passengers (in addition to pilot) and 25 lb of baggage for 120 mi. This performance is claimed to be the result of low-profile drag of the blades and high mechanical efficiency of the transmission.

The latter and is provided with variable pitch and fixed blades. It also has a cooling arrangement incorporating large fins on the bearing which is located directly in front of the blower moving air the horizontal engine, installation. (Flaps also are used on the tail to offset additional heat drops there.)

Down in a two-seater, the single seat is located in the rear of the cabin. Dual controls can be installed such as that an instructor and student can sit side-by-side, with the instrument panel directly in line of vision of both.

The panel is in the form of a truncated triangle to instrument arrangement with visibility from the cockpit and large Plexiglas sections in the nose give ample vision in all directions. Color arrangement is such as to avoid obstructions which would reduce the accuracy in the event of a hard or crash landing.

► Construction—As a safety feature

SPECIFICATIONS	
Weight empty	1,100 lb.
Gross weight	2,000 lb.
Maximum load	1,000 lb.
Power plant	165-hp Franklin engine
Engine diameter	31 in.
Engine speed	2,400 rpm
Rotor speed	230 rpm
Anti torque system	1.5 ft-lb
Control	4-bladed
Speed	120 mph
Altitude	10,000 ft
Range	150 mi
Turn	10 sec
Time loading	1-2 min
Power loading	1-2 min

Estimated Performance
Maximum rate of climb: 100 ft/sec
Maximum forward speed: 100 mph
Climbing speed: 100 mph

AVIATION WEEK, April 5, 1968

ENGINEERING-PRODUCTION 21



Aspects of MC. Mark VI-D's intake, blade, and transmission arrangement. Details are: 1, dog bolts; 2, 3, and 4, engine thrust, drag, and flapping bearings; respectively; 5, upper fuselage; 6, 7, 8, 9, 10, various sensors, antennas, and flapping bearings; 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

three doors are included in the cabin entrance—one each for the pilot and adjacent passenger, and another for the passenger sitting in the rear.

For each landing operation, the structure around the cabin is specially reinforced with strong bearings behind the front legs and in the nose.

The first blade of the rotor is designed to be fully flapping. Blades are of wood construction, if flaps are covered. The sub-rotor rotor is of the same construction but is a two-bladed arm rotor type.

Rate of maintenance was considered of prime importance in the design. Each component is fully accessible, and the unit type of construction enables for easy repair and replacement of parts.

► **New Model**—The craft is considered more than just an improved version of the experimental Mark VI (shown in the summer of '67). Although utilizing the basic arrangement of the VI, the VI-D has been designed to eliminate a number of potential maintenance problems. Thus, there are provided overhead drag, flapping, and hinge bearings to increase the life of these units. Although this increases weight penalty, it affords a desirable safety factor.

Development costs were minimized through employment of but two design men and four mechanical engineers. While the operators feel that it is still too early to discuss price, at a production basis of 100 machines it is expected that the cost of the "copier, made in Canada," will be under \$20,000.

Standard components include the horizontal Franklin engine (with modified crankshaft and added cooling ahead) and conventional bearings (except two in transmission).

French Jet Program Gathers Momentum

(McGraw-Hill World News)

Slow to show any results in the field of jet power, France's authorities are pouring efforts to expedite current developments.

[Highlighted] In having just won a vital program during the war, there do not have any power would tunnel for jet work. For a while they were able to use English facilities, but the British are now too crowded with their own work.

Presently, the French are building a large tunnel, which will approach Mach 7 at Avon in the Alps, but it will not be ready until 1950. And though construction has started on a new engine test station near Paris, the immediate lack of facilities requires that jet prototypes be built, often full size or in a diving model, on calculations only, and then tested in flight.

Several jets are under development, notably those by the Rubeis organization and also by a group of German technicians working in the south of France under the name of Talisman. The latter have tried to develop more efficient engine designs. Among these will be one plane which features an overhead jet engine.

But probably the next few years, France's jet planes will be powered by Rolls Royce's V-neck turbojet, and by the ATAR.

The V-neck is being built under license in France by Hispano-Suiza, who hope to improve it somewhat by development of more satisfactory alloys.

The ATAR is being developed under the sponsorship of the SNCMA (Société Nationale d'Etude et de Construction de Moteurs d'Aviation), the national company which groups the former Gnome-Rhône, Renault Jet, and Anson-Lorraine firms in a group of about 100 German and French technicians.

Engineers of the SNCMA willingly show the first ATAR. It is not yet completely mounted, though several units are already under construction in the company's research shops. First runs on the test bed, for the ATAR have been scheduled.

The ATAR is a development of the German BMW 003, advanced considerably by means of the same turbofan. Designed to reach 4000 lb. of thrust at 7500 rpm, it is a two-stage, 13 ft. long centrifugal, with a diameter of 35 in. It has a seven-stage and compressor, similar in design and also in design. Design comparison ratio is 4 to 1.

An article has already been made with part of the component, at an estimated cost of Mach. 7 for the unit.

Two unusual features of the ATAR are pointed out by design engineers. The compressor has no shaft running through it, but is, instead, a drum type—the core consisting of a series of seven disks with tapered edges which overlap each other. Blades are fixed to the tapered edges of the disks. Secondly, the turbine blades are cooled by a jet of air coming from the core.

But SNCMA officials insist the ATAR is far from being the jet engine of the future. They don't know yet what formula they want to follow, but have 120 technicians and draftsmen exploring different ideas. They expect to make their choice and start the new prototype sometime this year.

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<p>FLORIDA Miami, Berfield Instrument Corp., 7800 N.W. International Airport</p>	<p>MASSACHUSETTS East Boston, New City Aviation, Inc., Boston Municipal Airport</p>	<p>ILLINOIS Chicago, Boyer Aircraft Corp., 1210 W. 63rd St.</p>	<p>CANADA Montreal 16, P.Q., Aviation Beaulieu Limited, 2055 St. Pierre Ave.</p>
<p>GEORGIA Maconville, Atlanta Supply Corp., Atlanta Municipal Airport</p>	<p>MISSOURI St. Louis, S. S. S. Co., 1000 S. 10th</p>	<p>MINNESOTA Minneapolis 6, Airplane, Inc., West-Cleveland Field</p>	

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Scattered fragments recovered from scene of Bryce accident are shown suspended from ceiling in Douglas factory to afford crash-mockup reconstruction of DC-6. Postmortem proved attributable to CMB in leaving stores and spread of fire responsible for the accident.

Improvise Crash-Study Technique

Cause and course of Bryce DC-6 fire found by the reconstruction of wreckage, analysis of soot, and careful plotting of crash scene.

IN SCHUBER RANGES

Three truckloads of soot-laden fragments of a fire-ravaged aircraft have been made to tell the true story of a real-flight disaster, and the fact-finding action which was then demonstrated last given the Civil Aeronautics Board a new scientific technique for accident investigation.

As an aftermath of the Bryce Canyon and Gallup DC-6 fires, Airwest West now dedicates for the first time the employment of detective methods not available to those employed by a Coast Guard. These methods have included, simultaneously the cause and progress of the fire which cost a United Air Lines DC-6 crashing onto the plateau at Bryce Canyon, Utah, last October. What's more, they have been supported by evidence provided by the American Airlines DC-6 fire at Gallup, N. M., last November.

► **Technique Factors**—Applied for the first time to reconstruction of the Bryce Canyon disaster, the technique comprises: 1. Gathering and identification of every remaining fragment of wreckage; 2. Reconstruction from the fragments suspended by wires from the ceiling of a large room and installed in wooden frames of a "crash mockup"; 3. Chemical analysis of soot samples from two kinds of charred parts; 4. Physical study of wreckage fragments and 5. A joint engineering evaluation of test findings to arrive at a conclusive conclusion.

In this case, the motive "Schieber Holmes" has been James N. Peyton, CAA's Safety Bureau chief of Region VI, who conceived and directed the investigation project applied to the Bryce accident. Before this special case, casual radical proposals that could not have been achieved without the strong support of interested groups, he prides himself the commission said. "Credit for the technique goes to the entire investigating group of highly technical personnel of the CAA, Douglas Aircraft Co., and Institute of all the airlines all of whom were under the direct supervision and coordination of James N. Peyton, chief of Region VI, CAA Safety Bureau."

Leading the investigation was the fact that the Bryce crash occurred just inside a national park. Thus Government surveys were able to prevent entry to the crash area by those not personally involved.

► **Reorganization**—Coordinated—Peyton quickly coordinated a group of investigation committees created by engineers at Douglas, UAL, and the CAA to study power plants, instrument air, fuselage structure, heating and ventilation equipment, and the airplane's pre-crash flight paths. All were placed under a central committee consisting of senior representatives of Douglas and affected airlines, with Peyton as chairman.

It is noted that in this process relations

with the committee cleared the way part area of bodies before allowing a carefully supervised test by physics experts and engineers. Tests are now in progress to prevent movement of any parts of the wreckage. And the committee subsequently, coordinated the release of information on investigation developments. "What might appear to be a form of censorship seems to have been carried out to protect the airlines and airlines, to avoid sensational and highly speculative news stories prior to making definite conclusions on the cause of the accident."

► **Details of Study**—An initial plot, and an original position, in the investigation was determination of the airplane's impact attitude and position after impact. To this end Peyton plotted the impact area in 100-ft squares, using flagging stakes and color identification for crash tape. Before removal, plane fragments found within each square were identified and their positions related with relation to impact marks on the ground.

Results were tabulated carefully on a large square chart concerning the typical of wreckage, a distance of 1,000 ft below point of impact, and facing out to a width of 900 ft. From these studies was proved the mistake that the aircraft probably struck the ground at an angle of 10 deg and is skidding in the same turned over, bouncing first on its

Wreckage . . .



Reared and steel-damaged fragments from cabin heater area in Bryce Canyon DC-6, reconstructed to show cause of fire.

right wing and then on its left before coming to its present rest, about one pitch disintegrated.

Tagged and identified fragments as located at the scene of impact together with portions of the transport recovered along a flight path of more than 70 mi were taken to Douglas Aircraft Co. at Santa Monica, and there were a, mounted within a large room to 49 fragments that suggest a picture in the event.

The positioning was done in the plane can be appreciated from accompanying photographs of the accident crash mockup. In many instances portions of wrecked component metal bodies, such as the cabin heater, were placed adjacent to display wreckage, using, for instance, sea-sawing equipment.

At the first careful soot samples were taken from hundreds of wreckage fragments in the form of small pieces of the wreckage and were subjected to chemical analysis.

Peyton theorized that the seat would show, by its chemical structure, the origin of flame attacking various parts of the structure.

He was accurate in this assumption for analysis showed a heavy concentration of lead in soot portions of the under-luggage area facing the cabin air heating system—showing intense fire by loaded system guidance.

The fact that numerous fragments were missing from the structure within this area, more indicated to have been initially consumed under fire, is present to interest, there is second to point to the exact source of the fire. Absence of chemicals other than those which exist in gasoline cleared away implies that the fire might have originated from kerosene fuel or oiling oil. Heavy concentrations of hydrogen in some soot areas indicated the gasoline, in flight, of the airplane's fuel, which added to the

conflagration. Beyond the fire, cabin section area the seat content showed a chemical, at general conflagration through the presence of metal studs from seating structure.

Investigation was difficult at first, too, by soot reports showing concentrations of carbon. This was cleared when a chemical analysis that handling of the soot parts probably had accumulated soot particles with carbon released by both movement in the limits of investigation.

In a an, abstract, comparison, particularly noted during review and reconstruction by impact, carefully were located into a reconstruction of impact data to check their possible, possibly false or true, change.

Results of chemical analysis indicated that no gasoline had entered the cabin heating system as critical, had ignited within the heater, and then had been carried to the cabin area, as evidenced by the findings of the heater. This observation was supported by the absence of a large area of the aluminum section, evidently consumed during the initial stage of the fire.

From these, observations it became apparent that the source of fuel flooding into the air intake is dangerous quantity had to be either sewage through heating lines, or a broken fuel tank or had lost its main air intake, coming of gasoline from the pressure vent line of an exhaust blower had cut.

It was indicated that, while preventing, by their Bryce investigation, Peyton's examination had much, otherwise to corroborate evidence provided by the earlier American Airlines DC-6 fire at Gallup, in which the plane and passengers were saved.

Given space leading from the tank vent to the heater on the floor on the AA plane clearly showed the airflow course of the highly toxic aviation fuel. Satisfac-

On Mockup



The component mockup, composed of new parts, shows displaced cabin heater installation for comparison with crash reconstruction.

quest flight tests, pumping fluid under through the tank vent, supported their conclusion. At Douglas Aircraft, evaluation tests were made with cabin heater system at separate a plane, and when gasoline was poured into the intake, the resulting fire showed the same pattern as that indicated by the Bryce investigation.

Then, could be, an question that been produced concerning the Gallup fire, gave conclusive support to the findings, was sent analysis and study of the reconstructed aircraft involved, as in the case of the United accident at Bryce Canyon.

As a result, it is likely that this new technique will be a pattern for investigation of any future and similar aircraft accidents. The establishment of the strength of cause-and-effect theories gained from the Bryce studies, and proved by the Gallup inquiry, will surely the findings of an earlier before investigation in which these methods was to be used.

To define the nature of the Bryce crash provides special satisfaction—for he long long considered the out of these techniques, which as an investigation of lesser importance might have been deemed to be unusual.

A former IAWA pilot, Peyton quit his commercial flying career in 1938 to join the Air Safety Board of the first Civil Aeronautics Authority as assistant safety investigator. World War II interrupted his Government air safety work, and as an air officer he commanded the 33rd Bombing Group, spending 8 1/2 out of China as a pilot on Japan. Also, during the war he commanded Army's 4th and 9th Air Force units. Upon release from the Army he returned to his safety work and for two years was CAA Safety Bureau chief of Region II at Atlanta, preceding assignment a year ago at Region VI headquarters at Santa Monica.

LOCKHEED XR60-I CONSTITUTION



OUTER WIND PANEL. Assembly, above, shows basic structure of outer wind section ready to receive glazing. Sub section has

rectangular opening at forward end to provide thrust space making wing movement possible for each insect and rear



SEGMENTED FLAPS (below). The identical segments comprise the same with five letters on the Lockheed Constitution—five with

placed uniformly on each wing structure. Segments are interchargeable and each has cost of \$13.00, 47 in. chord.

Information Tips

Thompson, R. A., & Smith, J. (2002). The effects of social support on the health of older adults. *Journal of Aging and Health, 14*(1), 1-15.

[illegible]

Joe Baker Campbell

Volume II references work for multistage III and substage IV in new volume IIIB, *III and IV: Prolegomena to the History of the Development of the Concept of the Infinite*, by Louis de Brébais and Margaret P. Stanger, published by the American Philosophical Society, 1978, 198 pp., \$12.00. The new work City of Theoria is in progress, already and amicably, for the development of the new volume III, *III and IV: Prolegomena to the History of the Development of the Concept of the Infinite*, by Louis de Brébais and Margaret P. Stanger, published by the American Philosophical Society, 1978, 198 pp., \$12.00. The new work City of Theoria is in progress, already and amicably, for the development of the new volume III, *III and IV: Prolegomena to the History of the Development of the Concept of the Infinite*, by Louis de Brébais and Margaret P. Stanger, published by the American Philosophical Society, 1978, 198 pp., \$12.00.

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Princeton, Va. Aircraft Parts

New Shorland materials are used for reinforcement, and pellets are injected in place by three operators, and newly developed processes for solvent production are adopted in "The Case of Marlboro X" are 10-year improved cost levels, reduced by 20%.

Akwasi Tumbiwa

[illegible]

Take Subscription Business

Profits from Visa business and commercial bank business, ending March 31st, 1980 are \$10 and \$14. Interest income is \$10 and \$14. The balance sheet is \$10 and \$14. The balance sheet is \$10 and \$14.

Anticipating the Outcome

OE Intended to airport operators, maintenance men and small private business of aviation chemicals offered by M. M. International Corp., London N. Y. 2, describing sale of 18 airplane products covering wide range of maintenance and refueling equipment.



Bridgeport's new fabric will adorn United Air Lines' Mainliner "340

Inspired by the majestic beauty of Boeing's first StratuCruiser, "Queen of the Airline's," Birdgepote designers have once again created a distinctive new upholstery fabric for an exciting customer. Woven to an exclusive pattern, in both powder blue and cocoa beige, the new cloth will be used solely for upholstering the chairs in two tiers for outfitting United Air Lines' new StratuCruiser fleet. Because the new fabric is made of the finest quality woolsens and woolsens, United's passengers will find it delightfully soft and fur-emooth, yet non-clinging. Maintenance crews will like it, too, for, like all Birdgepote Aircraft Fabrics, it resists stains and dirt and makes periodic cleaning easier and faster. It is certified flame-proof by the CAA. What's more, special sewing and stretching characteristics will speed installation by as much as 50%.

Bridgport's specially designed aircraft upholstery fabrics are available in many strand weaves and appealing colors, or Bridgport designers will create for you an exclusive color or pattern. Write for full details and sample swatches of this extremely lightweight and durable fabric.

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NEW AVIATION PRODUCTS

Jet Heat Gager

Designed to measure gas heats of 5000 deg. F., new laboratory temperature indicator, Unit 261, offered by Fairchild Camera & Instrument Corp., Fairport, N. Y., is intended for use with turbines, engines, rockets, and for gas and research work. Injection of probe into gas stream and manipulation of signal control valve are only operations required to obtain measurements. Calibrated for accuracies of 1 percent up to 2000 F., and 2 percent in 2000-5000 F. range. Basic piezoelectric gas temperature system is form of gas thermometer and silicon diode as direct indicator of temperature. Metal probes are furnished for heats to 3900 F., and water cooled units with silicon diodes for temperatures to 5000 F.



Improved Lookout

Improved design of its semi-finished, inspection lookout is announced by Grp-Nut Co., 30611 South Michigan Ave., Chicago 4, Ill. Change gives wider and deeper triangular deflections at top, making greater flat area depression of threads for enhanced holding power, permits removal and replacement more frequently, with retention of high-torque value, and provides effective locking as threads not held to close tolerances.

Cleanse Spray Booths

Produced primarily as safety tool for use in cleaning floors and walls of guard spray booths and other hazardous locations is self-cleaning, basic sprayer manufactured by Angco Metal, Inc.

Milwaukee, Wis. Device is constructed of corrosion-resistant non-sparking aluminum housing with rounded edges to facilitate dust scraping edge in dirt against floor as other action involved bursters assure better cutting edge and expert self-cleaning action to tool. Unit is 6 ft. wide with deflected back, weighs 11 lb.

Aids Welding, Degreasing

Adaptable for use in wet/dry repair and overhaul shops is new perforated



steel box for welding and degreasing operations announced by Rock Engineering Co., Pittsburgh, Pa. Unit is constructed of heavy duty steel and is made in six standard sizes.

Smoke Tunnel

Compact but dimensioned Smoke Screen's wind tunnel, suitable for classroom demonstrations, general school use, and qualitative flow studies of typical aerodynamic problems is made by Aerobak Development Co., Pasadena, Calif. Continuous supply of hot steam-maintained, white smoke, is generated 2 mm. after starting. Carbons are mounted in separate box, enclosing smoke generator, reservoir and fuel supply tank. Fuel system (17 x 24 in.) is easily accessible for installation and change of models. Rotating mounting window, permits angle of attack, and control surface adjustments from outside during operation. Free standard models are furnished. Smoke volume and tunnel efficiency are stated to be readily adaptable with precision control through electrical and mechanical means. Smoke head with 16 uniformly spaced orifices gives uniform and parallel stream.



Aviation Spark Plug

Designed for commercial engines by AC Spark Plug Div., General Motors Corp., Flint, Mich., the CAA approved aviation spark plug, AC-101, features one-piece aluminum oxide insulator to give positive insulation between core pin and shielding barrel and prevent downward flash over. It is also constructed to eliminate dirt trap between core and shielding barrel insulator. Silver core-legs, cast, conducts heat away from firing end. Increased clearance around resistor is intended to afford better scavenging. Electrodes are platinum alloy, and side and throat are zinc plated.

Carbon Arc Torch

Seen as suitable for aircraft industry applications is new carbon arc torch for use with a.c. welding machines. Offered by Linde-Hydro Gas, Cleveland, Ohio, unit is designed to control rate of melting equipment in jobs where heat is desired without melting metal worked on. Device is adaptable to prefabricated and maintenance work such as



welding copper or brass parts, preheating steel areas prior to welding, heating and straightening bent work and brazing Monel metal, aluminum sheet and castings, and heating powder type of hard coating material in thin metals. Copper-coated carbon electrodes are readily adaptable and geared to move so that angle can be kept constant. Handle is provided with control into gear so that slight movement of thumb adjusts distance between carbons.

Parachute Harness

"Quick Fit" harness, developed by Pioneer Parachute Co., Manchester, Conn., permits different-size wearers to use same chute without size changing, manual adjustments. While in flight, harness may be water handily adjusted for added security, and conveniently, in emergency, by pulling adjusting straps. Device is standard equipment on company's chute.



SNOWFLAKES IN DEATH VALLEY



WENT'S MINOR-FIGURE 3, AirResearch turbine operates at speeds up to 300,000 rpm—minus 135° temperature drop in 7 pounds airflow per minute.

Pyral achievement of AirResearch in the "Mighty Minors" refrigeration machine.

Working less than 10 in., it fits into a man's hand. With an AirResearch heat exchanger, this unit cools air from 300° F. to below freezing—making inside the winged cockpits of jet planes. Designed for the Lockheed F-4B, supplied for the Douglas Skyhawk, SA-3600, Republic Thunderbolt and others, it has the same capacity as equipment capable of cooling a five room house in scorching Death Valley.

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SALES & SERVICE

Receiver Development Key To Private Use of New Airways

Without lightweight, low cost VHF navigation and communications receivers, private pilots face dim future on omni-range airways.

By ROBERT ROTZ

Private pilots who have been fearful that the intense and rapid receiver system recently recommended by the Radio Technical Commission for Aeronautics would mean serious curtailment of their cross-country activities may be pleasantly surprised.

Although the RTCA system are used primarily at holding altitudes and enroute altitudes, private pilots were disappointed in the recommendation of the RTCA. However, if J. B. (Doc) Harshbarger and Oliver Wilson of the Airline Owners and Pilots Association. Some notable reasons for recommending civilian use are:

► **First Phase:** The RTCA report is actually the first phase in a long process. Real test of whether the new receiver will help or hinder private pilots will come in implementation of the proposed program. The transition in CAA's VHF receiver program has been to push ground installations for ahead of airborne equipment development. This resulted in large expenditures for ground equipment that will not be of use to pilots in any quantity for several years due to the lack of airborne equipment to utilize the ground stations.

Implementation of the program will shortly be placed in the hands of a steering committee which has not yet been selected. Much of the treatment to be accorded private flying could be the program will depend on whether it is operated by a voting member on the steering committee.

One of the big concerns to private flying in the RTCA report was the first requirement that low frequency communications will not be de-emphasized and lightweight, low cost and technically adequate airborne equipment is available in quantity to use the VHF enroute communications system. This is a big question mark to private flying since airborne equipment to use it is all de-

veloped for airline-type aircraft.

► **Receiver Development:** The RTCA report called for extensive government efforts, backed by research and grant if necessary, to develop airborne VHF omni-range navigation receivers suitable for private type planes. CAA has been issuing private pilots that such equipment is technically and economically feasible but there is strong evidence to the contrary. Charles E. RTCA, former Deputy CAA Administrator, claimed such equipment could be produced at a retail price of about \$100, roughly equivalent to the price of low frequency navigation receivers and Radio Aeronautics estimated cost at \$1200 apiece when produced in lots of 5000.

NOFA recently developed specifications for a receiver that would meet economic and technical specifications of its members. Manufacturers have estimated its cost in quantity production at over \$1000. This of course would make the cost of enroute flying on CAA's omni-range to the private pilot.

NOFA estimates that some 13,000 lightplanes equipped to fly the present low frequency range airways.

► **Cost Efficiency:** One solution proposed in this publication is to cut costs by reducing operational efficiency of the equipment. In these receivers pilots would be able to use only four of the 18 of the digital 500 channels available on the CAA enroute. Objective to this solution is that it reduces the safety factor of aircraft as equipped and then lowers the safety factor at the enroute system. Many private pilots feel that they would be better off continuing with the present low frequency low-cost range than with a five-figure cost range. Several private pilots flying Beech Bonanzas equipped with airframe receivers have been attempting to use omni-range new airframe. They report that general functioning of ground equipment is too inaccurate to be dependable. The RTCA report also

took a swipe at the current accuracy of the omni-range. CAA, largely under airline prodding, has been working on a program of its Indianapolis Test Center to bring the omni-range accuracy to a point where it is operationally usable.

At present, only VHF communications receivers fit private pilots are accurate the omni-range. There is not even an advanced development model of the navigation receiver without which the omni-range system is useless to private pilots.

► **GCA Pushed:** Another point in the RTCA program that will be of considerable aid to private pilots is the recommendation that installation of GCA be given first priority until the program begins to catch up on 11.5 stations. ILS is useless for private pilots and many types of military aircraft while any aircraft equipped for normal instrument flight and two-way radio communications can use GCA as a last emergency landing aid.

Elimination of flow control from the final RTCA report can be considered another victory for the private pilot. Under this system all airports traffic would be handled under a priority system that put private flyers at the bottom of the list. In practice, the flow control system proposed could have turned private flying from omni-range.

The RTCA report proposes a still less substantial to be evaluated from the private pilot's viewpoint. However, the problem remains the same as in the current program—development of lightweight, low cost airborne equipment to use the various ground facilities.

Skyway No. 2 Sanctioned

CAA has designated as Skyway No. 2 a route extending from Seattle, Wash., to Boston, Mass., the second transcontinental skyway to receive official sanction. When completely installed, the route will be a 40-wide wide route spotted with standard air markers on mountains and prominent ground sites.

The route lines west to east starting at Seattle cover Spokane and Wenatchee in Washington, swings over the northern tip of Idaho and into Montana where it follows the Snake River valley to include Helena, Billings and Miles City.

Minneapolis and Fargo are on the route as North Dakota. In Minnesota, the skyway swings slightly southeast to cover Fargo, Duluth, Minneapolis and St. Paul. It continues through Wisconsin, crossing Lake Michigan at Milwaukee and picking up Manitowish in Michigan, over Grand Rapids to Detroit, where it turns along the Canadian side of Lake Erie, entering New York at Buffalo. Rochester, Syracuse and Albany are on the route.



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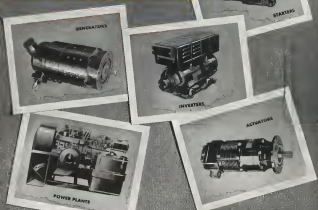
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Simpler Field Rules Reported By CAA

Changes designed to simplify application for authorizing the Federal Airport Act, in response to local and long distance from municipalities and the aviation industry, will be made effective May 1, F. B. Lee, Acting Administrator of Civil Aeronautics, has announced.

- Among changes:
- Existing contracts are permitted for sale of gasoline, oil, aircraft repair, and sale of aircraft parts and equipment. However, it is specified that conventional companies operating from these fields may be allowed to repair and furnish parts for their own aircraft, and may provide their own gasoline and oil from other sources than the vendor who has the exclusive contract.
 - Licensing agency may require from the exclusive contractor prompt, adequate and efficient service in fair, equal and non-discriminatory terms with local and reasonable prices to all users.
 - Licenses are permitted to let contracts for construction without competitive bidding, if approval from the Administrator is obtained in advance of contract letting.

The new changes have eliminated eight forms previously used, and consolidated two others, CAA reports. Project application and sponsor's statement agreement forms have been consolidated into one form. Use of the consolidated form between municipality May 1.

Provisions of the new regulation will be reported in respect to CAA to local sponsors who already have applied for grant often. Full text of the new regulations may be obtained from CAA Information Office, Washington 25 D C.

Legion Aids Miss. CAP

Mississippi Downtown Post of the American Legion has become the first post in the nation to mount sponsor ship of a state wing of the Civil Air Patrol. The local group plans to allow drive to double and possibly triple senior membership in the CAP by summer.

Current membership in Mississippi's 15 CAP squadrons includes 450 boys and girls between the ages of 15 and 18, and a total of 200 senior members. The 60 cadets in the Mississippi squadrons spend an average of two and one-half hours each week at headquarters receiving instruction in aerial acrobatics, communications, meteorology, navigation, aerodynamics and flying safety. Link trainer instruction also is given. The five Civil Air Patrol units are based at the state's CAP air field for World War II Veterans.



Kearse, lower fuselage work being done by Del Mar's gates and gates to field. Colorful metalwork and tables along parts, and various plastic lead gates cover air.

Airpark: Novel West Coast Model

Converted Navy blimp base featuring "Aerostol" promises profits for San Diego operators in first 12 months.

Del Mar Airport, near San Diego, Calif., rapidly is becoming a modest aviation resort which promises to enable its operators to look over a \$10 million in a capitalization of \$10,000.

Features which include to feature profits are: Location three-fourths of a mile off heavily traveled San Diego Highway 101, proximity to various play spots—Del Mar, Monterey, La Jolla, Rancho Santa Fe, San Diego (good restaurant, clean administration building and lounge, an "Aerostol" of an hotel type room plus backdoor operators, maintenance and storage shop, 10 "H" hangars, and a contract plane that is entering in both flying and highway guests.

H. C. Tolbert, president of Tolbert Good Aviation, Inc., operator of the field, reports that estimates are becoming familiar with his "Aerostol" and plan for it to be built on the main highway. "Normally it is filled to capacity on weekends, he has completed the main, and hopes to capitalize on the use of a by similar hotel units on other airports throughout the country.

► **Kearse**, Tinsdale-Originals, skews in Tolbert's use of marine housing and other good landscaping, vine-covered, but blending perfectly with the California ranches surrounding the airport. Guests leaving the Aerostol approach their planes through a marine garden drive, which brings a signboard inviting them to "Fly Back Soon."

For visiting women the location offers a 2040 ft. runway, partly paved, and a paved parking area measuring 1000 ft. by 600 ft. The field is lighted, but has no beacon.

A Community advertising once before the war "Tolbert spent four years in a Navy blimp pilot, and was the first officer in charge of Del Mar when it was used as a blimp base, during the war. Regarding the possibilities, he urged San Diego County to take over the field and other air bases when they were declared surplus after the war, and was instrumental in effecting the leasing of the fields to the county to protect competition.

To conduct a businessmen with an aviation team. Tolbert organized his present company with George Good, a wartime aircraft subcontractor. "I've now held a few low level of the airport with in option to renew for five years.

Exploiting their airport, Kearse is acceptance of the field by Murray-Vickelbush Co., a non-scheduled carrier and operator of the 50 ft. aviation ship.

Reckless Flying Runs Up Death Toll

Over half of all the 1009 fatalities reported in non-warmer flying in 1946, were a result of VFR flying accidents in violation of Civil Air Regulations, authors of the CAA Safety Bureau has disclosed.

Analysis of low flying accidents points strongly toward a need for greater attention to pre-flight instructions with student pilots, and greater need for stricter enforcement.

Normally all accidents were the result of careless and reckless flying of planes which were dual at, or less in, over



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Floor Under Airfreight Rates Urged by CAB Public Counsel

Brief to Board sees both certificated and uncertificated carriers losing money with present charges; notes flaws in combination passenger-cargo service.

A formula to make permanent the present surcharge on the airfreight rate has been laid before CAB.

Three of the Board's public counsel have urged that quick action be taken to establish minimum freight rates covering both certificated and uncertificated carriers. The floor recommended is considerably higher than the lowest tariffs now in effect.

Incidents Pile Up.—Public Counsel William Bart, James Durkin and Leo Lewis endorsed in large measure the operating philosophy of the all-cargo carrier. Coming less than two weeks after last winter's airfreight losses were recommended by CAB experts for route certification (Aviation Week, Mar. 23), the latest development further bolstered the anxiety of the independents.

Public counsel recommended that CAB fix a maximum rate of 16 cents a ton mile, applicable to certificated and uncertificated carriers, for shipments up to 3000 lb. The rate is based on the rule of carrying freight in all-cargo DC-4's.

Complete Reports.—A minimum rate of 14¢ cents a ton mile for shipments over 3000 lb. and 15¢ cents a ton mile for shipments over 16,000 lb. was applied. What's more, the Board now conducts a time and motion study to determine the difference in cost of handling large and small lots. In addition, both certificated and uncertificated carriers would be asked to submit more complete freight traffic and financial reports to CAB.

By last fall, freight rates had crept down to depths below 11 cents a ton mile for the certificated airlines and to rock-bottom deferred rates of 7.4 cents for the Flying Tiger line and 5.6 cents for Slick Airlines. Then CAB called a halt in October by imposing further proposed tariff cuts.

Cargo Plane Necessary.—The brief emphasized that the all-cargo plane (not combination passenger-cargo unit) is the backbone of the airfreight industry and will become increasingly important. It said that of increasing freight rates on the basis of the cost of all-cargo operation is the only course consistent with proper development of air transportation and the shipping standards of the Civil Aeronautics Act.

Whether or not CAB tries to combine freight rates higher than present levels, it

would uncertificated lines will be forced by rising costs to raise charges above their average 12¢ cents a ton mile level. If not, steadily has increased its income, and other independents are expected to follow suit (Aviation Week, Mar. 13).

Financial Crisis.—But the certificated trucklines have indicated no desire to boost rates voluntarily. They are opposing vigorously any move by CAB to increase charges by regulation. Also the Board soon may vote for all carriers, many airlines believe the certificated lines will push all but a very few cargo lines to the wall.

Because CAB discounts on the proposed combination of freight (aircraft) and the request of Railway Express Agency to deal with uncertificated air carriers will have an important bearing on survival of some independent all-cargo lines. The freight forwarder exception and REA proposal are strongly opposed by the certificated carriers.

Public counsel stated that the rates of both certificated and uncertificated rates are now below cost, "and yet each group has found the competitive necessity of maintaining these rates in the airfreight business."

Although the brief emphasized, in regular business, big business and growing fast later this year, freight traffic is not in order of the freight business. It is not in order of the freight business and only one uncertificated cargo carrier has shown the same level of business as passenger carriers by the carrier's own data in 1947 when CAB went into being.

Average Revenue.—During the first nine months of 1947, average freight revenue of Slick, The Flying Tiger and California Eastern Airways was 13.29 cents a ton mile against expenses of 27.35 cents a ton mile. Result was a loss of 14.06 cents a ton mile.

Public counsel said airfreight costs of the certificated airlines are more doubtful than they are covered with mail and passenger equipment. But rates by these lines are not comparable to rates of passenger carriers on the basis of passenger capacity.

Mail, Cargo.—"If United Air Lines alone, the volume of traffic it estimates for 1948 is more than 10 times that of packet costs will be 15.50 cents a ton mile should two cents above the

present specific commodity rate," the brief stated.

"Yet KLM, in its tariff of Oct. 25 (last) issued by CAB, attempted to reduce the rate to all commodities and all points. It seems clear the specific commodity rates of the certificated carriers have no invariable basis as yet."

Subsidy Element.—Public counsel then stated that if the rates of the certificated carriers are below cost, CAB may be called upon to endorse the freight deficit with mail compensation, continuing as element of subsidy. "This would mean the uncertificated carriers could be driven out of the freight business because of their competitors' access to support from public funds not available to the latter group."

The brief noted that the all-cargo plane today is carrying more than 70 percent of the freight flown by all carriers and that this percentage is growing. Among the certified carriers alone, all-cargo planes were used to land 51.7 percent of the freight business in the first nine months of 1947.

Argument Rejected.—Public counsel also pointed out that airfreight is carried on aircraft that they are very freight cheaper because they can put it in mixed cargo in combination passenger-cargo planes. Actually, the brief stated, the certificated lines have been able to use only a small proportion of such space.

During the first nine months of 1947, American, United and TWA met only 6 percent of the 177,944,000 available ton miles of freight space on their combination planes. Public counsel said the only line conclusion from this figure is that the great bulk of this space is not economically usable. CAB certified that the use of such space is more than five times as much as by freight in a cargo plane (on a combination plane under the added net theory).

Needs Differ.—The brief explained that the demand for cargo space is different from that for passenger space. Cargo is carried primarily at night between 8 p.m. and 9 a.m., while most passenger flights are during the day. It said that there is a minimum of cargo traffic for the numerous national passenger flights.

Other cargo business originates at points where passenger flights with freight space are not quickly available. Moreover, certain freight shipments are too large or too heavy for combination equipment. These conditions justify, in some extent, the recent findings of CAB examiners in the airfreight rate case.

Threat to Industry.—Public counsel said that if the industry fails to act quickly by conduct (added cost theory of charging on aircraft operating against

to flight level on combination planes itself, for a limited time, permit passengers to maintain their own heights. But, then, too, they would not proper development of altitude in the long run.

If the cost of service includes only the added overhead expense, carriers will, as all cargo airlines could charge freight rates as low as we wish a ton mile. A complete acceptance of the low product factor really means that cost would have no bearing on rates charged. Combination carriers would therefore have a low lead to destroy competition from companies operating all cargo planes.

► **Interline Methods**—If the future of flight is generally defined by its air, air, air, combination aircraft this outcome would be an early paper but desirable that that is not the case. The future of freight has not and some with all cargo planes. The inherent method of freight carriage should not be permitted to drive out the superior method.

Verifying of the low product factor leads to an economic drain, where a small volume of freight could be carried for six cents a ton mile, but a large volume (requiring all cargo planes) would need substantially higher rates.

Air Force May Lease T-46s to Leases

The Air Force has ordered plans to lease 10 T-46s to the Navy for \$500 a month, with a maximum cost to be paid for each aircraft.

Raymond A. Koster, director of procurement and industrial planning for the Air Force, told a House of Representatives subcommittee that the Air Force might purchase the T-46s as well as lease them. But he said the planes are not needed now.

In the proposal contract with Sikorsky, which specifies 12 T-46s, but not been signed. The Air Force said that the proposal terms could be revised to maintain the planes and to limit \$200,000 in expenses on each. Koster said the major part of the price was \$275,000 each. He explained that the Air Force has a large number of T-46s in storage, but that it would rather buy them than use them, because leasing them is more expensive.

A number of airlines, both civil and military, have indicated interest in leasing T-46s under various terms, such as the Air Force said. U.S. Airlines said that the Air Force is still in the process of leasing them, after being rejected in November, says negotiators a deal. The carrier had been using C-47s. Factors Air Lease reportedly has also shown interest in acquiring C-46s as cargo planes.



CONTINENTAL'S DOUBLED-DECKER

The updated North American B-70 bomber, used by Continental Air Lines as an executive transport, is also being employed to good advantage in freight flying over the Western Hemisphere. Continental officials state that the B-70's freight characteristics are very similar to those of the Conquest. Continental reports that the delivery of 100 passenger Conquests for the spring (AVIATION WEEK, May 22).

Helicopter Mail Volume Booms

But Los Angeles Airways finds itself in not as rosy-colored expectations.

Los Angeles Airways, the nation's first scheduled helicopter mail carrier, has had promising business during its first six months of operation. But at the same time, has found itself earning far higher than anticipated.

In December, its first month of operation, LAA flew 60,366 lb of mail on its circular routes in the Los Angeles area. In December the volume had increased to 92,946 lb, and the March total probably will reach 125,000 lb in service this month, passengers is expected to pass 250,000.

► **Mail for Road**—But the carrier's passengers, mail and mail plane make-up have made up in less operations out of the road. And Feb. 29, LAA had a record of 506,775. President Clarence Baker has not added C-46s to increase mail to 1 billion on a rate of \$1.65 a plane mile, to be applied on a base mileage of 35,537 statute miles.

LAA began service with four Sikorsky HO4S helicopters. In October the company had 9975 sales a figure which was increased to 14,551 in December. By 1945 in February and 10,714 in March. LAA expects for the six months rate 5177,795, which will be met through orders from mail gear. National average during the period was only 517.

► **High Costs**—Clearly increased costs, which brought about delays in other airlines during the past year, have LAA's mail cost studies out of line. Higher wages, insurance expense, depreciation and equipment prices have combined to keep the company in the red.

President Baker said insurance costs caused when companies halting the

police get out of the system because of the cost of the police with other costs cause at each higher cost. ► **Night Flights**—Insurance expense, which is increased flights during evening months because of heavier coverage necessary for the added cost of night flying. The first Officer Department has proposed night schedules on all route segments and those of LAA's helicopter service probably will start after dark service this spring.

Because of the warehouse's price (at \$5.50) from \$45,700 to \$75,700, mail is considerably higher. Dependence on the oil cost of fuel has increased. LAA states it will need at least one more transportation facility in flight to keep the cost down. And a sixth one will be necessary, later.

► **Equipment**—Late-model helicopter companies with late, discounted at a steep price, then are being sold. President Baker, LAA, estimated the service life of its \$3.15 in their years with a possible loaded value of about 10 percent.

But with extensive and development of LAA's routes at a rapid pace, this reported, most activity per month is being gained from each helicopter. As a result, system must incorporate mail truck investment in such as time taken to move to regional planes.

► **Expense**—No doubt—That cost to be met, evident in that of the new blades. With scheduled maintenance, at 1900 hours, LAA has not expected only about one year's service from its new blades. Baker believes that rapid expansion goals by LAA and other operators result in development of a new blade and its associated helicopter, further increases will occur where it will be necessary to increase depreciation charges considerably with increased schedules of service life.



MOVIE STAR

Capt. E. V. Rothermel, top-ranking World War II ace and pilot, is now a movie star. He is making his first movie, "The Great Escape," in which he plays a pilot who escapes from a prison camp. He is also making a movie, "The Great Escape," in which he plays a pilot who escapes from a prison camp.

► **Line Time**—Red-Decker (Red-Decker) is a new line of aircraft, designed for the purpose of flight. It is a new line of aircraft, designed for the purpose of flight. It is a new line of aircraft, designed for the purpose of flight.

► **Helicopter**—LAA's helicopters are being replaced by lighter and other night flying. LAA believes that the helicopters are being replaced by lighter and other night flying.

► **Wings**—LAA's wings are being replaced by lighter and other night flying. LAA believes that the wings are being replaced by lighter and other night flying.

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has been on the short flight from the Los Angeles Airport to the roof of the downtown Terminal Annex Post Office. Progress of LAA's operations, which are now being conducted on a day-to-day basis, is being watched closely.

Island Air Ferries Plans June 1 Start

Island Air Ferries, scheduled after a 29-month test-to operate between Long Island, N.Y., and Southern California, is planning to begin operations with three DC-3s by June 1.

It will also operate shuttle service between Lufkin Field, New York, and International Airport (Lufkin) and New York's LaGuardia Airport.

Five between Central Long Island and Bagdad, Conn., will be \$3.50, in 15 cents per passenger mile. Cost, possible without fare from Central Long Island to Bagdad, is \$8.92, including tax. Island Air Ferries has cost, will make the run in three hours.

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22. *Journal of the American Statistical Association*, 83 (1988), 1031-1036.

500

Colonel noted that Beach is disqualified on the ground he has a personal bias and prejudice against Calcutt. Beach had expressed belief that Calcutt required personal attention; that he opposed Calcutt's bid for a New York Washington route, because he saw his bid would be a big loss operating Eastern Air Lines American 5017. (Ex. 29)

The Milwaukee report, based on a placid and a sparsely populated area, has first 2600 ft. remains with 40 to 2

on the surface. Both countries have warm winters and rainfall to the north of Anatolia. But there is

Atlantic Seal Americans Inc., St. Petersburg, Fla., has asked CAB for a certificate to carry cargo on a non-scheduled basis between St. Petersburg and ports in the West Indies, Central and South America. The company now owns one C-46 and wants two C-47s.



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DIRECT SIGNAL — wires connected on leading edge of wing so that it originates from wall itself and not from a selected effect such as change in area or angle of wing. SQUARE HELIUM TUBE — square wire mounted on leading edge of wing with left and right wing joints when they meet in my heater unit. Light in condenser shows that when



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EDITORIAL

The Betrayal of Air Power

Gen. Dwight D. Eisenhower, Mar. 12, 1945:

"City after city has been systematically shattered. Our artillery could scarcely add to the completeness of the material destruction."

Reichsmarshal Hermann Goering, May 11, 1945:

"The American Air Force made the Allied offensive successful..."

Field Marshal von Rundstedt, May 5, 1945:

"Three factors defeated us in the west, where I was in command. First, the superiority of your Air Force which made all movement on daytime impossible. Second, the lack of radio fuel. Third, the systematic destruction of all railway communications so that it was impossible to bring one single railway train across the Rhine."

Field Marshal Albert Kesselring, German commander, May 16, 1945:

"Allied air power was the biggest single reason for Germany's defeat."

Field Marshal von Kluge, German commander, June 14, 1943:

"Every movement of the enemy is protected by its Air Force. He paralyzed all our movements by employing fighter bombers on an unprecedented scale."

Gen. Nishio, member of the supreme Japanese military council:

"It was air power which beat Japan, and the greatest failing in that future war will be fought entirely on the air. It is unfortunate that the Japanese were not willing to make the decision and concentrate all their creative effort in an air arm capable of waging such a war. We never dreamed air power could effect war to such an extent and we believed we could carry on with a land force through the war."

Adm. C. W. Nimitz, Commander-in-Chief, Pacific Fleet, May 22, 1945:

"I believe we have fought the last war in which our knowledge will be equal to the violence of our enemies. It is a military fact that the airplane and the potentialities of the rocket have rendered the conventional U. S. vulnerable to direct assault."

George Marshall, Secretary of State & Ex-Chief of Staff, March, 1948:

"I think one of the great difficulties in regard to air power and the American people's attitude toward life is that application of air power involves so much less of life of nonmilitary civilians and children as well as grown people. That is almost unresolvable and very trouble. We had reached the point in the last war when we were so inhibited over the question of the Japanese (and the Germans) that the American people were willing to go through with it. I thought it was vital that they should. But it is a terrible thing to do to use that type of power. If you are confronted with that is the beginning of a war, you are also confronted with a very certain reaction of the American people."

"They have to be driven very hard before they will agree to such drastic force... It is not that I am proposing that we do not have air power, and I am not at all. It may not be unresolvable but I do not think it is going to be the controlling factor and I think it is a tragic anomaly when it has to be done."

What does the American public think about air power? On Mar. 17 the Gallup poll released results of questions asked representative voters in seven sections of the country just prior to the Goodwillambian crisis.

The question was: Do you think the U. S. should increase the size of its Army? Navy? Air Force? Answers were: Army, 61 percent, no opinion 19 percent; Navy, 61 percent, no opinion 19 percent; Air Force, 74 percent, no opinion 19 percent.

General Marshall gives understates military aviation and the demands of the American people. Further, the Administration by their ridiculous insistence that the Army, Navy and Air Force share dollar for dollar have betrayed air power. They stupidly close their eyes to the lessons of World War II.

ROBERT H. WOOD

Beechcraft Bonanza...



...has a FEATHER-WEIGHT in its "Cool-Tank"



The Beechcraft Bonanza (Model 220, 42 Model) has three Feather-Weight oil coolers in its oil system. Each is a Feather-Weight oil cooler built into its Beech-designed "Cool-Tank".

The Beechcraft Bonanza is another of the growing numbers of modern aircraft that are taking advantage of the unique construction and accurate testing of FEATHER-WEIGHT oil coolers.

Light, strong and compact because their thin, all-aluminum sections are treated with aluminum alloy, FEATHER-WEIGHT oil coolers offer maximum resistance to extremes of temperature, pressure, vibration and abuse.

Testing in the largest, most modern wind tunnel laboratory in the aeronautical heat exchanger industry accurately predicts FEATHER-WEIGHT performance under actual flying conditions.

Inquiries concerning FEATHER-WEIGHT all-aluminum oil coolers are invited. CLIFFORD MANUFACTURING COMPANY, 345 E. First Street, Boston 22, Massachusetts. Offices in Chicago, Detroit, Los Angeles.

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